Hofmann, of Berlin. Considering the well-deserved international position of Dr. Hofmann, his personal influence on the development of applied chemistry as well as of pure science, and the excellent official English report he wrote on the Chemical group of the London Exhibition of 1862, no better choice could possibly have been made. Wishing to give a more comprehensive work even than that of 1862, and to do so within reasonable time, Dr. Hofmann had recourse to a subdivision of labour, and a great number of practical and theoretical chemists of different nations have contributed articles for this work. Some of these contributors, such as Professors Frankland of London, and Wurtz of Paris, occupy eminent scientific positions; others are eminently fitted for the subjects they have treated by their practical pursuits. The report is intended to come out in three parts, containing the industrial applications of metalloids, of metals, and of organic compounds respectively. The first part, which has appeared, contains the following succession of papers:—"The Elements of Water," containing oxygen, hydrogen, and also ozone and peroxide of hydrogen, by Dr. A. Oppenheim; "On Drinking-water," by Dr. Edw. Frankland; "On the artificial production of Cold and Ice," by Dr. H. Meidinger; "On Chlorine, Bromine, Iodine, and Fluorine," by Dr. E. Mylius; "On the Sulphur-industry of Sicily," by Dr. Angelo Barbaglia; "The Manufactory of Sulphuric Acid," by R. Hasenclever, director of the Rhenania Chemical Works at Stolberg; "Ammonia," by M. Seidel, manufacturer at Amsterdam; "Nitric Acid," by Dr Ad. Geyger; "Protoxide of Nitrogen," by Dr. O. Liebreich; "Phosphorus and its Applications," by Dr. A. v. Schrötter (the discoverer of amorphous phosphorus); "On Carbon and Graphite," by Dr. R. Biedermann; "On Sulphuret of Carbon," by Dr. O. Braun, manufacturer at Berlin; "Cyanides," by Dr. E. Meyer, director of the Koepenik Chemical Works; "Silicates," by Dr. R. Biedermann. This enumeration shows that the variety of subjects treated on in about 350 pages is too great to allow of a detailed review, and we can only say that many of these papers offer an unusual interest.

The leading idea has been to give first a short history of the manufactures in question, and then a succinct account of the latest improvements. The most prominent samples exhibited at Vienna and the prizes awarded by the jury are shortly mentioned. The book is designed by its editor to be more than a monument of the last International Exhibition, viz., a history of chemical industry in a very readable form, and a desirable addition to the existing manuals of pure and applied chemistry. He has taken great pains not only in gathering an effective staff of fellow-workers around him, but in distributing the work, adding supplementary information, and arranging the papers in a systematic form.

Very many of the communications which appear here in print are based upon letters elicited from the best known manufacturers of various countries. The second part of the Report is now about to leave the press, and the third part is expected to be printed during the coming winter. An English translation and an Italian one are being prepared at the same time.

A. OPPENHEIM

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

The Spectroscope and the Weather

WE were visited here, on the 11th inst., by a very severe thunderstorm, beginning a little before noon and lasting for about an hour and a half. Anxious to confirm some observations made recently in the West Indies, in which I got from lightning a *continuous* spectrum, I took out my pocket spectroscope, and on looking through it was at once struck by the peculiarity of the spectrum. The band noticed by Prof. P. Smyth (vol. xii. pp. 231, 252) on the less refrangible side of D was very distinct, while the band (W.L.L. 5830–5680) on the more refrangible side of D was also very, though not nearly so dark, leaving the appearance of a bright yellow band over the part of the spectrum W.L.L. 5880–5830, as in the sunset spectrum, only much more marked. The A, B, and C lines were all visible; E and *b* were very sharp, *b* being easily separable into three lines; while there was also a dark band (W.L. 5040?) between *b* and F, but no lines visible *beyond* F. The most peculiar point, however, was the rapidity with which the spectrum varied, for, keeping the instrument pointed in one direction, each different cloud that passed differed in the intensity of the darkness of the band W.L.L. 5970–5900, which sometimes could be distinctly separated from D, while at other times it appeared quite continuous with it. The darkest bands were given by the lurid purple and pillared white-grey clouds. During all this time the heat had been intense, and the thunder was accompanied by light gusts of wind varying as much as 90° in direction, but about 1 o'clock rain began to fall and the abnormal bands to disappear. By 4 P.M. the band W.L.L. 5830–5680 was almost quite gone, and the band W.L.L. 5970–5900 had also become faint, appearing like a shadow cast by D, which was sharp and clear except in the light reflected from a few of the heaviest clouds. On the 12th the sky was still very much overcast and the spectrum again slightly abnormal, but not more so than I have noticed it in a thick "Scotch mist." To-day, with sky still completely overcast, the spectrum is quite normal.

The instrument used was one of Ladd's excellent small pocket spectroscopes.

C. MICHIE SMITH

F. C. Manse Keig, Aberdeenshire,
Aug. 13

Sea Elephants from Kerguelen's Land at Berlin

THE expedition sent by the German Government to observe the Transit of Venus at Kerguelen's Land has brought home a noble series of specimens.

The most interesting of these are the skins and skeletons of male and female Sea Elephants (*Cystophora leonina* = *Morunga elephantina*, Gray), adult and young. The largest male is fortunately full grown, though not old, or of so large a size as some of the skulls preserved in other museums would apparently indicate. Still it is a noble specimen, and has been admirably prepared under the direction of Prof. Peters. The skeleton, when ready, will be mounted and placed by its side in the museum.

Though the existence of this wonderful Seal was made known more than a century ago by Pernetty, and subsequently described with more or less graphic detail and exactness by Anson, Cox, Péron, and other antarctic explorers, when it inhabited comparatively accessible localities, there was, so far as I know, no full-grown male specimen in any European museum until this one reached Berlin; and it is only a full-grown male, as is well known, which possesses the remarkable nasal appendage which suggested the name "Sea Elephant." A young male can hardly be distinguished from a female. Some writers have described the appendage as a sort of trunk—more than a foot long—indeed it is so figured in the plates to Péron's "Voyage aux Terres Australes;" but Anson, speaking of those he found at the island of Juan Fernandez, compared it to the wattles of a cock. The justice of this comparison is well shown in the Berlin specimen. The appendage is there seen to be a

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hoodlike dilatation of the nostrils, much wrinkled and puckered, and subdivided by transverse constrictions at intervals of about three inches. It was found impossible to extend it into anything like a trunk, though it was quite soft and flexible when it arrived, having been sent home in salt. In fact, it closely resembles the "hood" of the Bladder-nosed Seal (*Cystophora cristata*), but is smaller in proportion to the size of the animal, and different in shape. Péron, who described it as a trunk, was so good an observer, and generally so trustworthy, that I can hardly believe that he invented the resemblance; indeed he called the animal "Phoque à trompe" in consequence of its possession of it. Might not the individuals that he described, which inhabited Bass's Straits, have belonged to a different species? The upper lip is about two inches high, above which the crest, or hood, rises four inches more, and is prolonged backwards over quite half the head, in the integuments of which it is gradually absorbed. The animal measures fourteen feet six inches in length from tip of nose to tip of tail, and sixteen feet three-and-a-half inches to the extremity of the hind flippers, taking the measurements along the curve of the back. The total length along the ground is fourteen feet one inch. The girth is eleven feet, measured just behind the bands. The vast bulk of the fore-part of the body; the diminutive hands, armed with long nails; the short, widely spreading feet; the thick, clumsy neck, and the huge head crowned with its strange appendage, recall exactly the male animal depicted in the plate of "A Sea Lion and Lioness from Juan Fernandez" in Anson's voyage, over which it has been the fashion to make merry for the best part of a century; and vindicate the accuracy of that intrepid seaman. The skeleton was in process of maceration, with the exception of the head: this measured rather less than two feet in length. The sutures are all open, and the teeth unworn. It was impossible to examine the other bones with any accuracy, but the epiphyses appeared to be united. Besides the skin and skeleton of the full-grown male, there are the following:—

Young male, eight days old, skin stuffed, skeleton complete.
" older, skin without skeleton.
Female, full-grown, skin stuffed, skeleton complete.
" " skull and imperfect skeleton.
" " three skins.

The expedition has also brought home a male and female *Otaria* of singular beauty, quite new to science, for which Prof. Peters has proposed the name *Arctophoca gazella*, from the name of the vessel on board of which the voyage was made. There are also a skin and skeleton of the Leopard Seal (*Stenorhynchus leptonyx*), and many skeletons of Albatross, Penguin, Petrel, and Sheath-bill. Last, but not least, there is a skeleton of a *Delphinus* from the African coast, which will probably turn out to be either new, or one of those that have hitherto been known from skulls alone brought home by sailors.

While one cannot give too much praise to the skill and energy of the naturalist who has done so much in so short a time, and in so difficult a locality for work as the inhospitable shores of Kerguelen's Land, or to the University of Berlin for the instructions given before the expedition started, it is not in human nature to forget that the Germans are not the only nation who sent an expedition to that spot. Moreover, although these specimens could not be better placed than as part of the extensive collection now forming at Berlin, and, so long as Prof. Peters has charge of it, will be at all times accessible to all comers, yet Berlin is distant a journey of a day and a half from London, and in consequence the majority of Englishmen must remain as heretofore in ignorance of what a Sea Elephant is like. Why will our countrymen obstinately refuse to take the trifling amount of trouble necessary for the killing, the preparation, and the packing of this and allied marine mammals? Again, why, when an expedition is about to start, do not those in authority give stringent orders for the capture of the mammals that are known to exist in a given locality? Even from a commercial point of view the acquisition of these animals might be advantageously undertaken; as a brisk competition would ensue among all the museums for their possession, if perfect skeletons, in good condition, were to be brought home.

Vienna, Aug. 21 JOHN WILLIS CLARK

P.S.—As a rule, when "Sea Lion" is spoken of in the old voyages to the Pacific and South Atlantic, what we term Sea-Elephant is meant—a true Seal; while our Sea Lion—an *Otaria*—is spoken of as a "Seal."

OUR ASTRONOMICAL COLUMN

VARIABLE STAR (?).—Mr. J. E. Gore, of Umballa, Punjâb, suspects variability in a star "about 2° preceding the 5 m. σ Andromedæ, which Harding shows a 5 m. star, and which is not in Lalande," and he gives as the approximate place for beginning of the present year, R.A. 0h. 2m., and N.P.D. 53° 59′. On looking up the history of this star there will, however, hardly appear sufficient proof of any change of magnitude. Though it does not occur in the reduced Catalogue of Lalande, the star was, nevertheless, observed by him, and the place for 1790 will be found in "Connaissance des Temps," An. vii. p. 423, where the star is called 6 m., and being one of the large numbers of stars the positions of which were communicated by Lalande to Bode, in manuscript, it appears in the catalogue to his large atlas, and is there called E Andromedæ, but a 5 m., with Lalande as authority. Bessel (Zone 386) estimated it 7; it is 6·2 in the "Durchmusterung," and 6·7 in Heis.

THE SOLAR ECLIPSE OF SEPTEMBER 28-29.—This eclipse, which will be visible as a small one in these islands, is annular on the central line, but the track of annular phase upon the earth's surface is such that it appears only one of the established Observatories will be included within it, viz., that of Harvard College, Cambridge, U.S., and here the sun will be little elevated above the horizon. The *Nautical Almanac* contains the times of beginning, greatest phase, and ending, for Greenwich, Cambridge, Oxford, Liverpool, Edinburgh, and Dublin, and from these data the times for any place in England may be readily interpolated on the simple method proposed by Mr. Woolhouse in the "Companion to the Almanac" for 1871; or, for fifty or sixty miles round London the time of first contact, of which alone an observer needs any warning, will be obtained with precision (effect of tabular errors of course excepted) by the following formulæ:—

$$\begin{aligned} \text{Cos. } w &= +\,0{\cdot}14193 - [0{\cdot}13402] \text{ sin. } l + [0{\cdot}06273] \text{ cos. } l, \text{ cos. } (L + 86^\circ\, 18'{\cdot}2) \\ t &= 1\text{h. } 33\text{m. } 0\text{s.} - [3{\cdot}71112] \text{ sin. } w - [3{\cdot}77334] \text{ sin. } l \\ &\quad - [3{\cdot}84549] \text{ cos. } l, \text{ cos. } (L + 82^\circ\, 41'{\cdot}5) \end{aligned}$$

Here l is the geocentric latitude of the place, L its longitude from Greenwich, + if E., − if W., and t the Greenwich time of first contact; the quantities within square brackets are logarithms.

At Gibraltar, where the eclipse will be about as large as at any point in Europe, it begins at 10h. 35m. A.M. on the 29th, local mean time, and at the time of greatest phase, 11h. 53m., the magnitude of the eclipse is 0·43 (the sun's diameter = 1); the first contact at 79° from the sun's north point towards the west. At Malta there is a small eclipse (0·10), the middle at 1h. 49m. local time.

At the Observatory of Harvard College the annular phase begins at 6h. 21m. 10s. A.M. mean time at Harvard, and continues 3m. 12s., the sun's apparent altitude between 5° and 6°; the eclipse begins about half an hour before sunrise. At New York (Mr. Rutherford's Observatory) the greatest phase, 0·91, occurs at 6h. 10m. A.M. twenty-five minutes after sunrise, the eclipse ending at 7h. 25m. At Halifax, Nova Scotia, the greatest phase, 0·90, is at 6h. 56m., with the sun at an altitude of 11°, and the end of the eclipse at 8h. 5m.

The next annular eclipse of the sun will take place, 1876, March 25, in British Columbia and the Hudson Bay Territory; and the next solar eclipse visible in this country is that of 1880, December 31.

THE MINOR PLANETS.—Eurydice, which has been selected by Prof. Galle as affording at the approaching opposition another opportunity of obtaining an independent value of the amount of solar parallax, will be found very close upon the position assigned in the ephemeris published in the "Berliner Astronomisches Jahrbuch" for 1877; on August 29 the planet was as bright as stars of the tenth magnitude. Fortuna, at the present

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